in practice—though few object to seeing two doctors and acting on their advice—all would like personally to avoid the magistrate.

These two last suggestions, however, deal with cases more advanced than those suitable for general hospitals, and it is the exceedingly early maladjustment that I am most concerned about.

To those who fear to advocate these reforms on account of the expense I would say that they will come slowly enough, however much we may push for them, and it is probable that measures properly thought out would lead to economy, industrial peace, and a happier race, and justify all expenditure. Early treatment for these badly oriented people is as necessary, and quite as profitable, to the country as for tuberculosis. Why should not funds be forthcoming from the same source?

Summary.

To sum up I would suggest that it is desirable:

1. That every general hospital should have facilities for treating early nervous and borderland patients.
2. That child guidance clinics should be available for the young maladjusted children and be under the charge of doctors.
3. That delinquents should have expert examination with regard to their mental adjustment—on the first offence—repeated if necessary.
4. That voluntary boarders be allowed in county mental hospitals.
5. That early insane patients should be able to be treated on two doctors' certificates.
6. That vocational guidance should be available for all who wish it—as at the National Institute for Industrial Psychology—as a preventive measure against maladjustments and unrest.
7. That every medical student should be obliged to devote some time to the study of all forms of mental disorder.
8. That examining boards should require evidence of knowledge of all forms of mental disorder.

It is better to pay for this than for insanity, delinquency, unemployment, and industrial unrest. May we all live to see a goodly measure of the above reforms in this our beloved and on the whole stable country.

THE HISTORY OF SCARLET FEVER.*

BY

J. D. ROLLESTON, M.A., M.D., M.R.C.P., F.S.A.,
Medical Superintendent, Western Fever Hospital, London.

The study of the history of scarlet fever is beset with two chief difficulties, inasmuch as, not only in the remote past, but until comparatively recent times, it was often almost impossible to disentangle the description of scarlet fever from that of other acute exanthemata, especially measles and erysipelas, on the one hand, and from that of diphtheria on the other.

An attempt has been made by some writers to trace back the history of scarlet fever to classical antiquity. Some, such as Malfatti, Collier, and Clifford Allbutt, have tried to identify it with the celebrated pestilence of Athens which occurred in the year 430 B.C., but the description given by Thucydides (Lib. II, cap. 47–54) indicates typhus rather than any other acute infectious disease.

Sanné remarks that certain passages in Hippocrates have given rise to the belief that the Father of Medicine was familiar with scarlet fever, owing to his speaking of an illness attended with a severe sore throat, though he makes no mention of a rash. As Sanné points out, however, the mere existence of ulcers on the tonsils does not justify the diagnosis of non-eruptive scarlet fever. The same objection applies to writers, such as Willan, who think they have found allusions to scarlet fever in certain passages in Celsus, Caelius Aurelianus, Aretaeus of Cappadocia, and Aetius of Amida, whereas diphtheria was probably the disease in question.

Herodotus, a physician belonging to the pneumatic sect, who flourished at Rome under Trajan about half a century before Galen, is credited by Bateman with having described "with considerable precision" the rashes of scarlatina as well as those of measles and small-pox. Bateman's account, however, is far from convincing.

The Arabian physicians, such as Avicenna, Ali Abbas, and Rhazes, have also been credited with allusions to scarlet fever. Rhazes, for example, stated that measles of vivid coloration was more dangerous than that which was but moderately red. It is but useless conjecture, however, as Welch and Schamberg remark, to regard such sentences as references to scarlet fever.

The first undoubted description of scarlet fever in medical literature is to be found in a work by John Philip Ingrassias (1510–1580), who was first professor at Naples and during his last twenty years lived at Palermo, where he was equally celebrated as an anatomist and as a medical practitioner. In his book entitled *De Tumoribus praeter Naturam*, published at Naples in 1553, he speaks of a disease popularly known by the name of "rossalia" or "rosania," which consisted of "numerous spots large and small, fiery and red, of universal distribution, so that the whole body seems on fire." "Some there are," he continues, "who think that measles is the same as rossalia, but we have often seen that the two affections are distinct, trusting in our own eyes and not merely in the description of others."

Willan has identified the pestilential sore throat described by Wierus as spreading through Lower Germany in 1564 and 1565 as epidemics of scarlatina anginosa. It was particularly fatal to infants, and the sore throat was accompanied by violent fever, vomiting, swelling of the parotid glands, and an erysipelatous rash.

The next most important writer on scarlet fever was Baillou (Ballonius), who, under the title of "rubiolae," described the principal varieties of the disease, including scarlatina anginosa. In an epidemic which occurred in Paris in the winter of 1574–75 there was a very high mortality, and medical art was of no avail.

Jean Cottyar of Poitiers, a contemporary of Baillou, in his work entitled *De febre purpura epidemiale et contagiosa libri duo*, published in Paris in 1578, is generally credited with having given the first description of scarlet fever in France, but Noirot considers his account is far from possessing the importance attributed to it by some persons who have probably never seen it. Cottyar describes the initial symptoms as general weariness, headache, redness of the eyes, sore throat, and fever which may be mild or violent. Some patients, he says, are comatose throughout the disease, while others are wakeful and restless. Purpura appeared on the second or third day, accompanied by delirium and soreness of the throat.

A much more important position in the history of scarlet fever is occupied by Daniel Sennert (1572–1637), who described an epidemic which occurred at Wittenberg in the beginning of the seventeenth century. He identified it with the rossalia of Ingrassias, and described the eruption in similar terms to those used by the Neapolitan writer (in statu vero universum corpus rubrum et quasi apparet ac si universali erysipelate laboraret"). Sennert was the first writer to mention scarlatinal desquamation ("epidermide squamarum instar decidente"), the early arthritis ("in declinatione materia ad articulos transfertur ac dolorem et ruborem ut in arthriticis excitat"), and post-scarlatinal dropsy and ascites ("mox pedes ad talos et suras usque intumescunt"). It is noteworthy that though the occurrence of dropsy was recognized as a sequel of the disease before scarlet fever was given its name, it was not until two hundred years later, after the appearance of Bright's work in 1827, that its connexion with renal involvement was realized. The epidemic which Sennert witnessed was obviously severe and often fatal ("malum hoc grave et saepe lethale est"), and convalescence was protracted ("aegrique non sine magno labore et post longum tempus pristinae sanitati restituuntur"). In more than one passage (De febribus, *Op. omn.*, T. vi, Lib. iv, cap. 12, pp. 483–484; *Epist.*, Cent. II, Ep. 20) he expresses his doubts as to what name he should give the disease. "I should have regarded it," he says, "as

* A paper read in the Section of History of Medicine at the Annual Meeting of the British Medical Association at Cardiff, 1928.

erysipelas, and some of our women call it 'Rottlauf,' but for the fact that it does not attack adults but only children. The vulgar look upon it as measles, and say of it 'Die Masern laufen zusammen.'"

Before taking leave of Sennert mention should be made of his son-in-law, Michael Doering, who observed an epidemic in Poland during 1625, and also noted the desquamation, rheumatoid pains, and anasarca characteristic of the disease. Contrary to what is stated by Noirot and Sanné, he expressly mentions inflammation of the tonsils and surrounding parts among the symptoms of the disease (Sennert, *Epist.*, Cent. I, Ep. 88; Cent. II, Ep. 18).

In 1665 scarlet fever reappeared in Poland, where it was described by Simon Schultz under the name of "epidemic malignant purpura." In the following years it was observed by Rayger in Hungary, Ettmüller and Lange at Leipzig, Schroek at Augsburg, and Ramazzini at Modena. Rayger describes a case of which he was in charge in 1636, in a girl aged 20, and did not hesitate to identify it with the "rossalia" of Ingrassias. The patient not only had a dense rash, but also inflammation of the tonsils. "As the fever declined a windy tumour attacked the left hand whereby the fever was dissolved" (obviously a case of early scarlatinal arthritis).

The term "scarlatina" is generally supposed to have been first introduced into medical literature by Sydenham about 1675. Hirsch, however, doubts if he was the first to use the term, as in Lancellotti's *Monum. stor. Moden.*, 1, 208, 382, there is a reference under the year 1527 of persons dying of "male da scarlatina." Goodall, in the latest edition of his work on infectious diseases, has also drawn attention to the term "scarlett fevour" being used in *Pepys' Diary* on the date November 10th, 1664, the passage being as follows: "My little girle Susan is fallen sick of the meazles or at least of a scarlett fevour." It is however, an open question whether scarlet fever was really meant in either of these passages, especially in the last where Pepys applies the indefinite article to "scarlett fevour."

Richter has pointed out that Sydenham's chapter on scarlet fever did not appear in the 1666 and 1668 editions of the *Medical Observations*, which were then entitled *Methodus curandi febres propriis observationibus superstructa*, but was first published in 1683 at Amsterdam, only six years before Sydenham's death, in the first complete edition of his works; while the *Processus integri in morbis fere omnibus curandis*, which contains a shorter account of the disease in Chapter VIII, was first published in 1693, or four years after Sydenham's death.

Sydenham's description of scarlet fever in the *Medical Observations* (Sect. VI, Chapter 2) runs as follows:

"Scarlet fever may appear at any season. Nevertheless, it oftenest breaks out towards the end of the summer, when it attacks whole families at once, and more especially the infant part of them. The patients feel rigors and shivering, just as they do in other fevers. The symptoms, however, are moderate; afterwards, however, the whole skin becomes covered with small red maculae, thicker than those of measles, as well as broader, redder, and less uniform. These last for two or three days and then disappear. The cuticle peels off, and branny scales remain lying on the surface like meal. They appear and disappear two or three times."

The disease, in his opinion, was merely a moderate efflorescence of the blood arising from the heat of the preceding summer or from some other exciting cause.

As regards treatment, Sydenham expressed himself as chary both of blood-letting and clysters on the one hand and of cordials on the other. Complete abstention from animal food and fermented liquors he regarded as sufficient treatment. Although the patient should keep indoors it was not necessary to stay continuously in bed. When the desquamation was complete the patient should be purged with some mild laxative suited to his age and strength.

"By treatment thus simple and natural," he continues, "the ailment, we can hardly call it more, is dispelled without either trouble or danger, whereas if on the other hand we overtreat the patient by confining him to bed or throwing in cordials or other superfluous and overlearned medicines, the disease is aggravated and the sick man dies of his doctor" ("nimia medici diligentia").

In the concluding paragraph he alludes to the possibility of fits or coma occurring at the onset of the eruption, for which he recommends the application of a large blister at the back of the neck and a draught of syrup of poppies.

The mild character of the disease as Sydenham knew it is shown not only by what he expressly says ("hoc morbi nomen, vix enim altius adsurgit"), but also by his making no mention of the sore throat and of the complications of rheumatism and dropsy already described by Sennert and Doering. It is possible, however, as J. F. Payne suggests, that when Sydenham saw a bad case of scarlet fever he failed to recognize it as such. Payne adds that the inadequate description of the disease given by Sydenham largely contributed to the misunderstanding of scarlet fever and sore throats in the next century. On the other hand, inadequate as Sydenham's description undoubtedly was, we must be grateful to him for having established the autonomy of scarlet fever and given it a name to distinguish it from the other acute exanthemata, particularly measles.

It is, therefore, a regrettable fact that Sydenham's contemporary and successor Richard Morton maintained that scarlet fever was absolutely the same as measles, and only differed from it in the character of the eruption. "Let this fever," he says, "be expunged from the roll of diseases, unless it seem good to give it the name of confluent measles." Unlike Sydenham, he described a malignant as well as a mild form, and recorded eleven cases which had occurred in his own practice, in both children and adults, including two of his own daughters, aged 7 and 8 years.

Like Sennert and Doering, and unlike Sydenham, Morton expressly mentions inflammation of the fauces in the acute stage and alludes to dropsy and ascites as sequels. He also appears to be the first author to note the occurrence of scarlatinal otitis, in a sentence where he speaks of an acrid and corrosive discharge of pus from the nose, ears, and throat. (*Exercitatio tertia*, Cap. 5.)

In spite of Morton's attempt to identify scarlet fever with measles, the distinction established by Sydenham was henceforward accepted by subsequent writers in the seventeenth and eighteenth centuries, such as F. Hoffmann, Juncker, Cullen, Frank, and Vogel. Juncker in particular, in his *Compendium medicinae theoretico-practicae* (1724), adopts Sydenham's view of scarlet fever being an attempt of Nature to rid herself of acrid caustic matter, and as a harmless disease if left to itself, but likely to be troublesome if treated by a too hot regimen.

It is true that an attempt was made in the beginning of the nineteenth century by Jahn and Piorry and Lhéritier to revive Morton's unitarian doctrine, the last two writers inventing the term "hémo-dermite morbilleuse" to include both scarlet fever and measles. Their views, however, did not meet with any acceptance.

Scarlet fever seems first to have been recognized in Scotland at the end of the seventeenth century. Sir Robert Sibbald, physician to Charles II, president of the College of Physicians of Edinburgh, and geographer of Scotland, in his work *Scotia Illustrata*, published in 1684, speaks of scarlatina as one of many other diseases which had arisen in that century, and suggests that it was due to the "depravities of the humours which have resulted from a growth of luxury." In the experience of Sibbald, who describes a case in the daughter of a judge of the High Court, the disease was rare and not often fatal.

According to Lützhöft the epidemic at Copenhagen in 1677, described by Ole Borch under the name of "rossalia squamosa," was scarlet fever, and was probably the first outbreak of the disease in Denmark. It was not, however, until 1760 that the first Danish monograph on the disease, entitled *De febre scarlatina*, was published by Wernicke.

During the eighteenth century numerous epidemics of scarlet fever occurred throughout Europe and the United States, and were described by various writers, the best known of whom were Huxham, Fothergill, and Withering in this country, Storch and Zimmermann in Germany, De Haen in Holland, Plenciz in Austria, Rosen von Rosenstein in Sweden, Tissot in Switzerland, and Benjamin Rush in the United States, where scarlet fever first appeared in 1735.

Though scarlet fever was generally regarded in the eighteenth century as a distinct disease from measles, there

was a tendency to confuse it with angina maligna, which was not finally established as a distinct disease until the next century, when Bretonneau gave it the name of "diphthérite" in 1821. Withering, for example, at first was of opinion that scarlatina anginosa and angina gangrenosa were distinct diseases, but afterwards became convinced that they constituted but one species of disease, and Willan had no hesitation in ranking the "garrotillo" among the varieties of scarlet fever. Cullen, on the other hand, expressed the opinion that scarlet fever was specifically different from angina maligna.

From perusal of the English writers in the first half of the eighteenth century, especially Huxham and Fothergill, who described epidemics of sore throat with and without a rash in Plymouth and London respectively, it appears that these were concurrent outbreaks of scarlet fever and diphtheria accompanied by some cases of ulcerative sore throat or pseudo-diphtheria.

Among the eighteenth century writers special mention must be made of Rosen von Rosenstein, who, in his work on diseases of children, describes the occurrence of scarlet fever at Upsala in 1741 and at Stockholm in 1761, and notes the appearance of secondary adenitis on the eighth or ninth day and of anasarca between the eighteenth and twenty-second. He is also one of the earliest, if not the first writer, to mention the possibility of a non-eruptive scarlet fever.

The disease, in his experience, varied considerably in severity.

> "The scarlet fever," he says, "is sometimes and in some persons so favourable and gentle that the patient only requires a good nursing, whereas sometimes it is so lethiferous that it will carry off the patient in a day or two."

In like manner De Haen, after speaking of the mild form of scarlet fever seen by Sydenham, describes malignant outbreaks at the Hague in 1748 and 1749, and alludes to a malignant epidemic which had occurred some years previously in Etruria.

During the last thirty years of the eighteenth century, even when allowance is made for the prevalence of diphtheria, there was a considerable increase in the incidence of scarlet fever, epidemics of which occurred in England, France, Germany, Italy, Holland, Sweden, Denmark, and also in North America. The outbreaks for the most part were mild in character, but an epidemic in central Germany, which lasted from 1795 to 1805, was attended by an unusually high mortality, which was attributed to the abuse of sudorifics and stimulants.

In the commencement of the nineteenth century the tendency of malignant and extensive epidemics to be followed by periods of lesser prevalence and low mortality is well illustrated by the experience of Graves in Dublin and of Bretonneau in Tours. According to Graves the epidemic of 1801–4 was extremely fatal, death sometimes taking place on the second day, whereas the frequent epidemics which followed during the next twenty-seven years were always of a mild character. Subsequent epidemics of malignant scarlet fever which broke out in Dublin in 1831 and 1834 caused more deaths than cholera had done two years before or typhus did some years later.

Similarly Bretonneau, who had never seen a death from scarlet fever in his practice during the period 1799–1822, in less than two months of the year 1824 experienced an epidemic at Tours attended with so high a mortality that he came to regard scarlet fever as no less deadly a disease than plague, typhus, or cholera (Trousseau).

Bretonneau clearly differentiated scarlatinal angina from diphtheria by pointing out, first, that in scarlet fever the inflammation is widely diffused over the tonsils, palate, and pharynx, and is not, as in diphtheria, at first limited to one spot, and secondly, that the scarlatinal inflammation of the pharynx has no tendency to spread into the respiratory passages. Trousseau, who is constantly acknowledging his debt to his old master, epigrammatically sums up the last distinction in the sentence "La scarlatine n'aime pas le larynx."

The chapter on scarlet fever in Trousseau's clinical lectures contains a masterly description of the disease, in which he not only develops the doctrines of Bretonneau, but also draws attention to the characteristic tachycardia, fall of temperature by lysis, and frequent occurrence of miliaria, and gives his celebrated account of the "formes frustes" or defaced types of the disease.

In the course of the nineteenth century several parts of the world which had hitherto escaped received their first visitation of the disease, such as Madeira in 1806, South America in 1829, Greenland in 1847, Australia and New Zealand in 1848, and California in 1849.

In his recent report to the Ministry of Health Dr. Allan C. Parsons points out that though it became possible, after the establishment of general registration of deaths by the Act of 1838, to compute rates of mortality from scarlet fever, the old confusion between malignant angina and scarlatinal angina prevented the earlier returns from being strictly comparable with more modern data. The mortality from scarlet fever in this country was undoubtedly very high for at least fifty years after the introduction of registration, the maximum being reached in 1863. During the last fifty-five years the mortality from scarlet fever in this country has shown a steady decline, which is particularly striking in comparison with that in eastern Europe, especially in Poland, Bulgaria, and Rumania.

Since the war an enormous advance has been made in our knowledge of the etiology, prophylaxis, and treatment of scarlet fever. Although Klein suggested a streptococcal origin for scarlet fever as long ago as 1887, there was a tendency until about five years ago to regard streptococci merely as secondary invaders. George and Gladys Dick, however, proved by experiments on human volunteers that scarlet fever is a local infection of the throat caused by a particular type of haemolytic streptococcus which is capable of producing a soluble toxin, absorption of which causes the general manifestations of the disease. In 1923 they successfully inoculated volunteers by swabbing their tonsils and pharynx with four days old cultures of the haemolytic streptococcus grown from the pus of a finger of a nurse who had contracted mild scarlet fever. In the following year, by intracutaneous injection of the filtrates of the culture of the scarlatinal streptococcus, they devised a test, now known as the Dick test, which determines whether the subject is susceptible or immune to the disease.

Their results were confirmed by other observers, and although they have not found universal acceptance, especially in Germany and Italy, they have had far-reaching practical applications both in prophylaxis and treatment. Active immunization against scarlet fever has been undertaken on a large scale in the United States and on the Continent, especially in Poland, by injection of scarlet fever toxin modified or not by various methods, while a less durable immunity is conferred by specific scarlet fever antitoxin. A curative serum, prepared by injection of a horse with the specific toxin, is one of the most valuable additions to therapeutics in recent years, and far surpasses in efficacy the use of the serum of convalescents, which was tried by a few clinicians some years previously.

Before the introduction of specific methods isolation of the patient was the only procedure which could be said to have had any prophylactic value. As in the case of diphtheria, however, in the pre-antitoxin era almost all the agents in the materia medica were tried in turn. The most popular preservative was belladonna, which was introduced by Hahnemann, the founder of homoeopathy, and enjoyed a considerable vogue for some time, especially in Germany.

Good results were claimed by Miguel of Amboise in 1834 from inoculation of the fluid obtained from puncture of the eruption, but he does not appear to have had any followers to confirm his results. The methods of treatment were also very varied, and included bleeding, cold or hot effusions, and a host of drugs of an emetic, purgative, diaphoretic, tonic, or narcotic nature.

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THE LIGHT SENSE IN MINERS' NYSTAGMUS.*

BY

R. J. COULTER, M.B., B.Ch., F.R.C.S.I.,
Ophthalmic Surgeon, Royal Gwent Hospital.

I AM fully aware that this communication is incomplete and inconclusive, but I have some hopes that it will open up a fresh aspect of the subject with which it deals, and induce others to investigate the changes which occur in the light sense in miners' nystagmus, and possibly find in it some help in elucidating the mysteries of that most complicated condition.

My attention was first directed to the subject by a paper read by Mr. Percival at the Oxford Congress,[1] in which he stated that in all cases of miners' nystagmus which he had examined he had invariably found the light minimum greatly increased, while their light difference was very little if at all greater than his own. At the same meeting he demonstrated the simple apparatus which he used in making the examination; it consists of black-and-white discs with sectors of white and black of varying sizes on them, which, when rotated on pins, show grey circles of varying intensity. My tests have been made with this apparatus, but recently I have checked the light difference with Young's discs, and find that it is easier to work with them and that the results are similar, so far as I can judge. Unfortunately Young's portfolio does not contain a light minimum test.

The accompanying table is founded on the records of

The Light Sense in 100 Cases of Miners' Nystagmus.

LIGHT MINIMUM.				LIGHT DIFFERENCE.			
	Total.	No Miners' Nystagmus.	Miners' Nystagmus or Neurosis.		Total.	No Miners' Nystagmus.	Miners' Nystagmus or Neurosis.
200	8	4 } 29	4 } 30				
100	51	25 }	26 }	100	51	26	25
50	31	12 } 16	19 } 25	50	35	14 } 19	21 } 30
25	7	3 }	4 }	25	11	5 }	6 }
12.5	3	1 }	2 }	12.5	3	0 }	3 }
	100	45	55		100	45	55

Light Minimum.—Normal or practically normal=59 per cent.; reduced=41 per cent.
Light Difference.—Normal=51 per cent.; reduced=49 per cent.

100 cases, and the first thing that strikes one is that my results are exactly the reverse of Percival's, as they show reduction in both the light minimum and the light difference in about 50 per cent. of the cases. This naturally puzzled me, and on thinking the matter over I came to the conclusion that Percival's observations must have been made on fresh cases, while mine were made on old ones, which were sent to me for examination with a view to ascertaining whether they had recovered. I wrote to Mr. Percival, and he kindly replied, stating that this suggestion was correct, and that he agreed that both light senses are reduced in old cases. I have not been able to verify the observations on fresh cases, but if it is true that they have an increased light minimum which later turns into a deficiency it is a remarkable phenomenon. Percival attributes the early increase to an increase of endogenous stimulus, and considers that this also accounts for the intolerance of light, but this latter may persist after the light minimum has become reduced. It would seem that either the increased endogenous stimulus must be sufficient to overcome the reduction in light sense which becomes manifest after it has passed off or that the reduction is something fresh which develops after the men have ceased working underground.

Coming to my cases, and adopting Percival's nomenclature and standard, only 8 per cent. had a normal light minimum, but 51 per cent. had the next grade labelled as 100, while in the remaining 41 per cent. the light minimum was definitely reduced. I have divided these cases into two groups according to whether I considered from their other signs and symptoms that they were still suffering from miners' nystagmus, or neurosis arising out of it, or had recovered. Of course this is only an opinion to be taken for what it is worth, but it indicates that, although 50 per cent. of the cases with full light minimum still showed evidence of the disease, and one of those with the lowest grade measurable by the test was free from symptoms, there was a definite increase in the proportion of those still suffering from miners' nystagmus to those who had recovered as the light minimum diminished.

Dealing with light difference I found a similar condition. It was normal in 51 per cent. and subnormal in 49 per cent., while the proportion of cases with signs or symptoms of miners' nystagmus to those without them tended to increase more definitely than in the case of light minimum.

I am aware how inadequate these records are, both in numbers and in the manner in which they have been worked up, but in spite of this I suggest that possibly there are some lessons to be learnt from them. The first is, unfortunately, the negative one, that I have not found any evidence that examination of the light sense will help us in definitely deciding whether a man has recovered from miners' nystagmus. Another arises from a consideration of the possible causes of the symptom. At first sight it would seem to be obviously a part of the neurosis which is the true cause of most of the incapacity arising out of the disease, but it is possible that this may not be so in all, or even in the majority, of the cases. During the war Ransome Pickard and G. W. Lloyd[2] found that a number of men who were invalided suffered from a mild form of scurvy with night-blindness, due to deficiency of vitamin from insufficient supply of vegetables, and had symptoms somewhat resembling those of miners' nystagmus, and Barton states that the blood of men suffering from the disease is deficient in haemoglobin, the average being 75 per cent. of normal. It may seem a far-fetched theory that some of the prolonged cases of miners' nystagmus are really suffering from vitamin deficiency, but these men cannot be in a position to afford expensive food, and it is possible that they may be using margarine, which is notoriously deficient in vitamin D. I throw out the suggestion as indicating a line on which investigations might be carried out with regard to the general condition of the sufferers from this most serious disease, on the lines suggested by Mr. Freeland Fergus, with some possibility of doing something for the patient. I cannot refrain from expressing my opinion that in spite of all the discussions which have taken place on miners' nystagmus, and all the money which has been spent on compensation and deciding whether individuals are entitled to it or not, the poor patient has been most shamefully neglected, and very little attention has been paid to his general condition or to the measures which ought to be adopted to improve it.

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